

# Long-term challenges for near-term large loads

EFI Foundation Workshop

February 12<sup>th</sup>, 2024



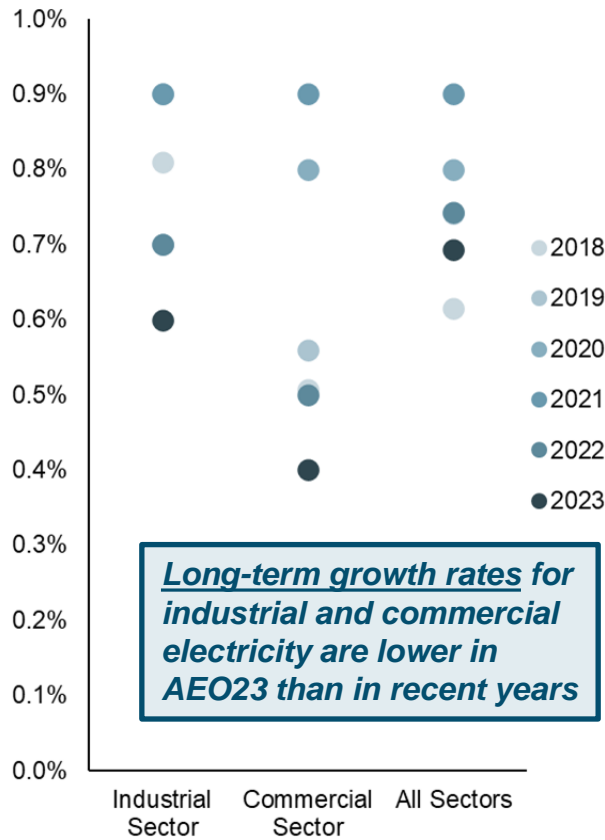
Energy+Environmental Economics

Tory Clark, Partner  
[tory@ethree.com](mailto:tory@ethree.com)

# Long Term Economy-Wide Models are Likely Underestimating Data Center and Manufacturing Loads

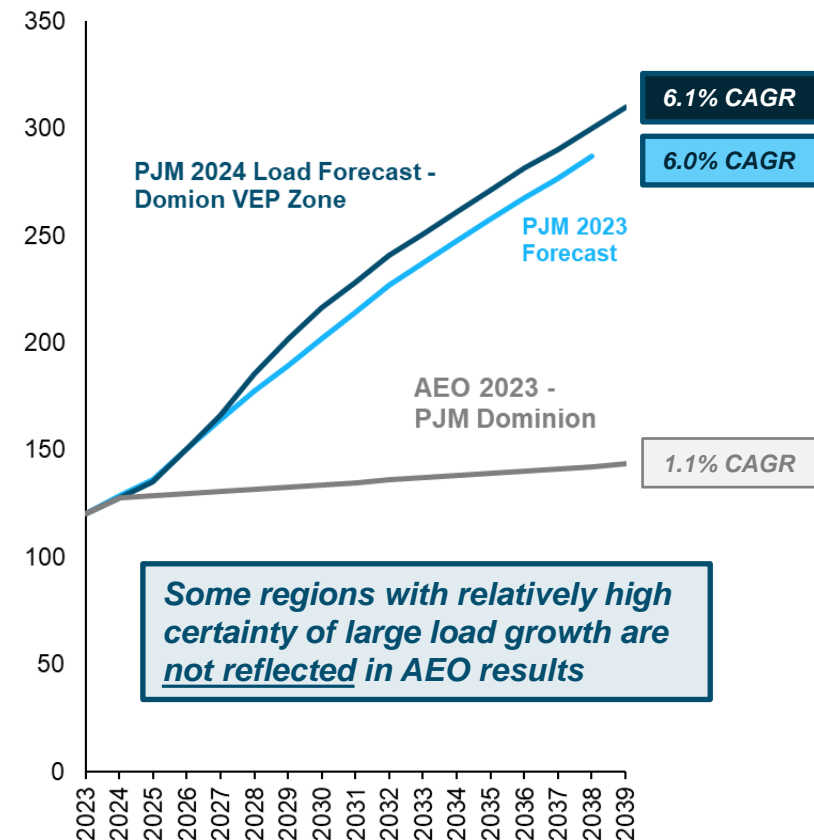
- + Many economy-wide models base their commercial and industrial energy demands on EIA's Annual Energy Outlook (AEO), but this likely underestimates growth from data centers and a resurgent manufacturing sector
- + This implies that long term models used to evaluate deep decarbonization pathways are potentially missing a key source of electricity demand in some regions

AEO Long-term Growth Rates for Electricity Use CAGR (start year to 2050)



Source: [EIA Annual Energy Outlook](#)

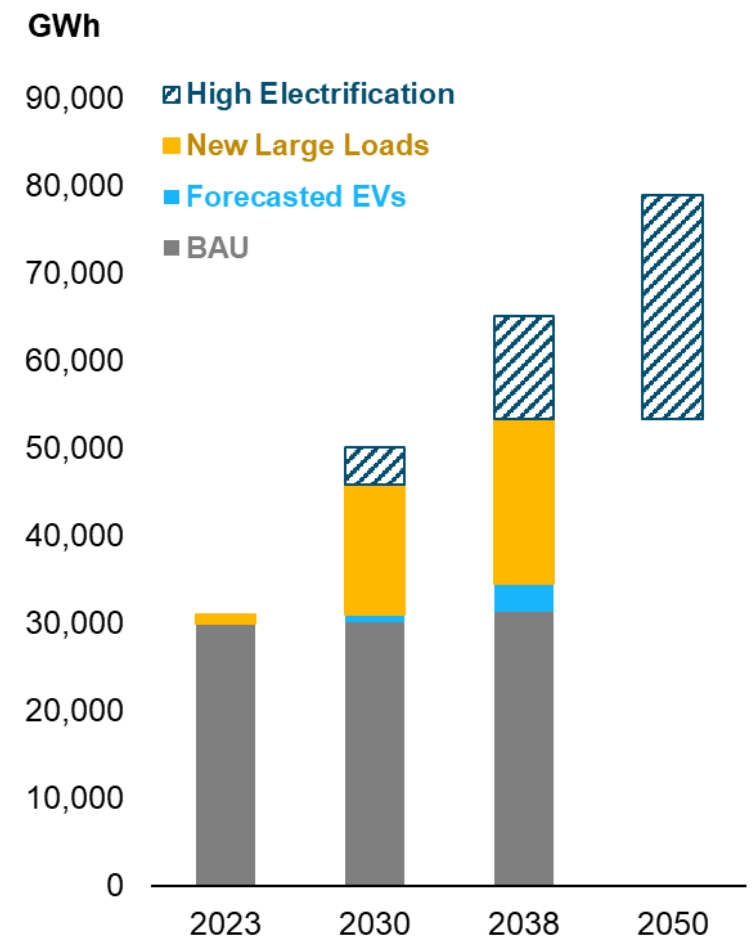
Dominion Virginia - Annual Electricity Demand TWh



Source: [PJM 2024 Load Report](#), [PJM 2023 Load Report](#), [EIA Annual Energy Outlook](#)

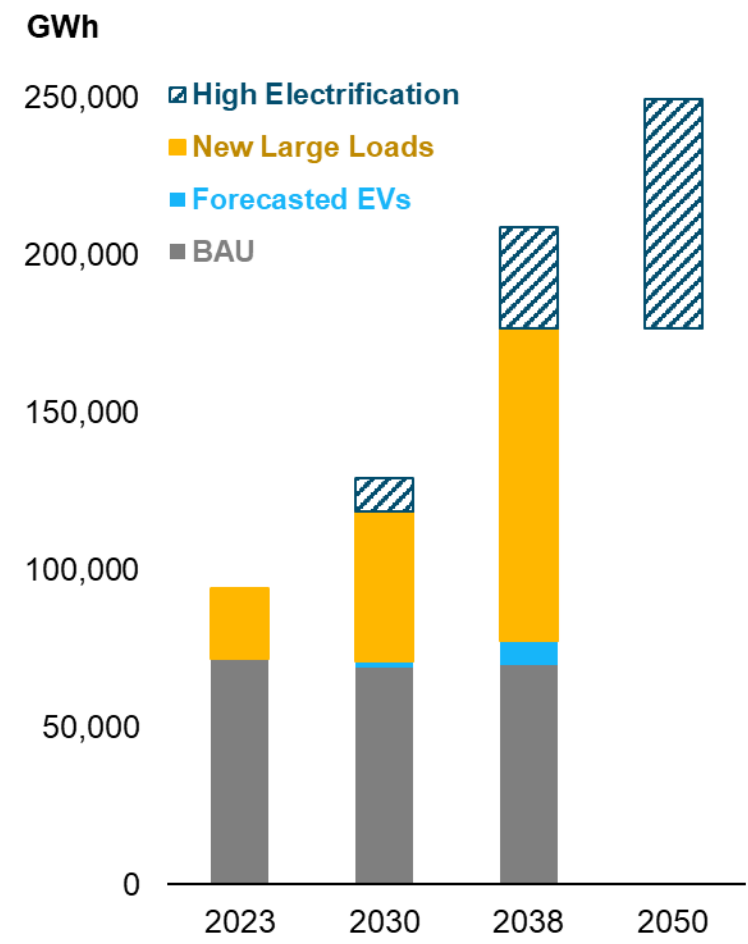
# New Large Loads Could Have Greater Impact than Electrification in Some Regions

## Arizona Public Service



Source: [APS 2023 Integrated Resource Plan](#), E3 electrification estimates\*

## PJM - Dominion



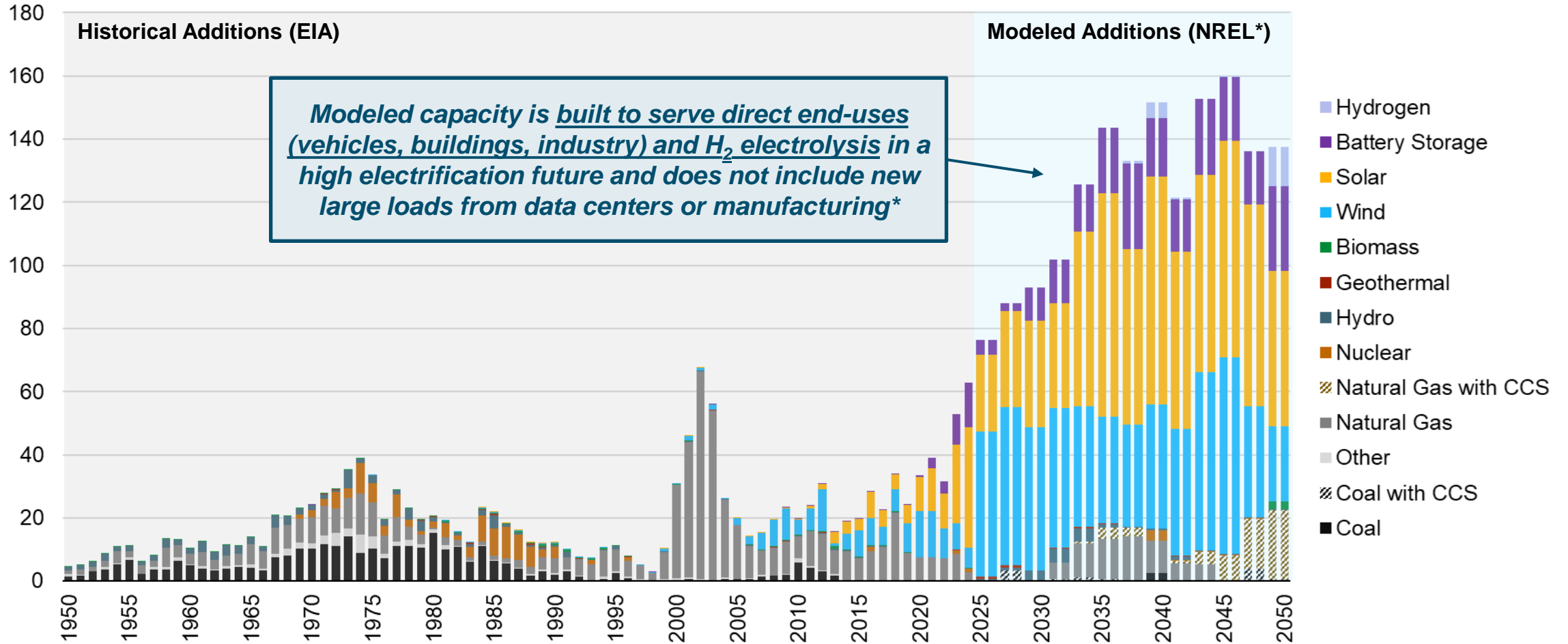
Source: [Dominion Virginia Electric and Power Company 2023 Integrated Resource Plan](#), E3 electrification estimates\*

- + Growth in data centers and new manufacturing facilities varies widely by region
- + Where it is concentrated, these load impacts could be similar or higher to those of electrification needed to achieve deep decarbonization

*\*Note: E3 electrification estimates for transportation, buildings, and industry are based on a national net zero scenario developed for United States Climate Alliance*

# High Electrification Requires Unprecedented Grid Buildout, New Large Loads Will Compound the Challenge

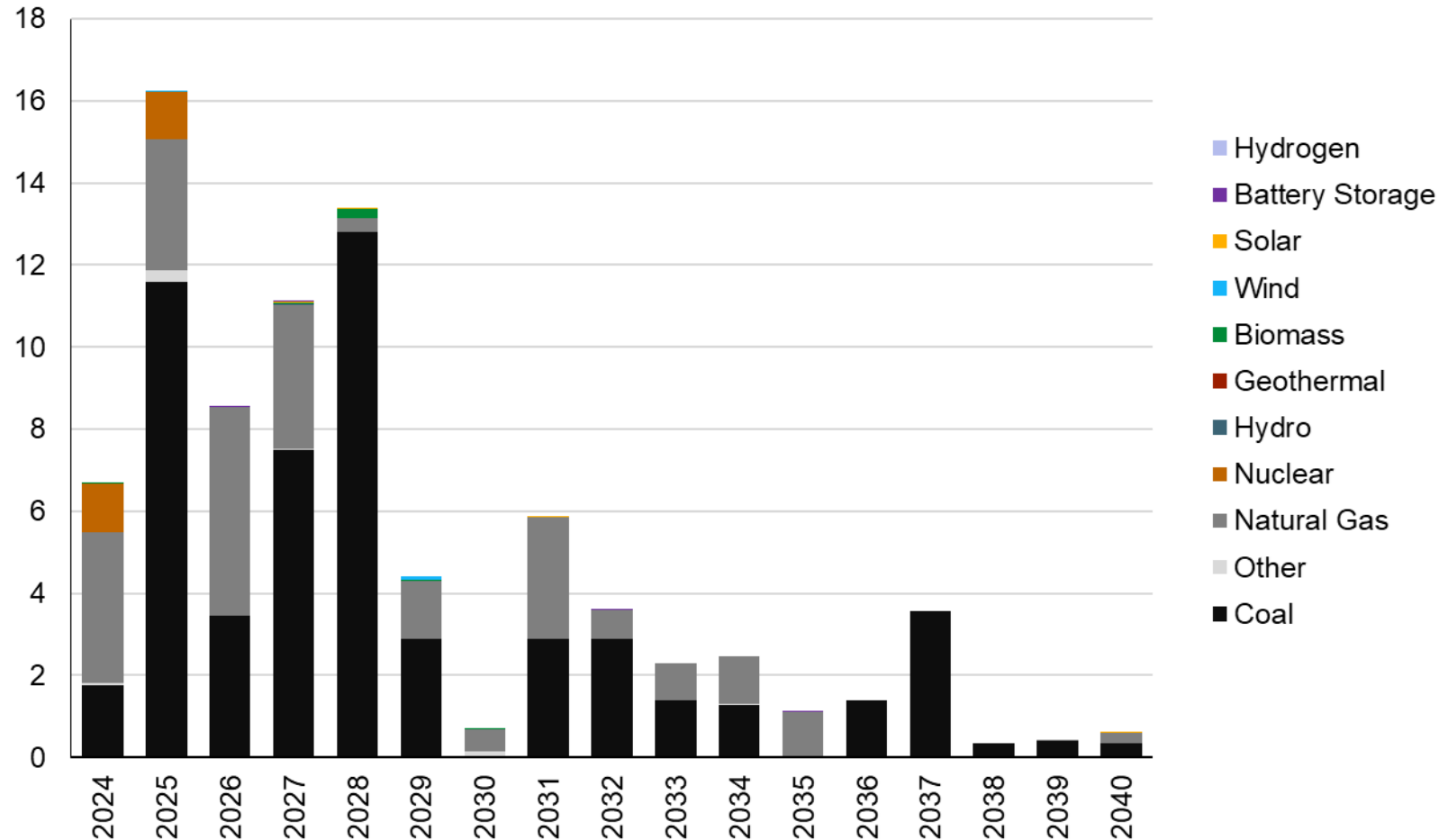
Annual Electricity Generating Capacity Additions in the Contiguous United States  
GW/yr



Source: [EIA Form 860](#), [NREL 2023 Standard Scenarios](#)

# Previously Unexpected Load Growth Could Put Scheduled Generator Retirements at Risk

Planned Electricity Generating Capacity Retirements in the United States  
GW/yr



Source: [EIA Form 860](#)

- + By 2030, around 40 GW of coal capacity and 18 GW of natural gas capacity is scheduled to be retired based on EIA data
- + If new generating resources cannot be brought online fast enough to meet growing demand from new large loads, previously scheduled retirements are at risk of being delayed